IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Patent Application of	Conf. No.: 4818
DIETRICH et al.	Atty. Ref.: JAR-3691-661
Serial No. 10/797,580	TC/A.U.: 1794
Filed: March 11, 2004	Examiner: Piziali, Andrew T.

For: COATED ARTICLE WITH LOW-E COATING INCLUDING IR REFLECTING LAYER(S) AND CORRESPONDING METHOD

* *

(August 8, 2010 = Sunday)
August 9, 2010 (= Monday)

Mail Stop Appeal Brief - Patents
Commissioner for Patents
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Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

Appellant hereby **appeals** to the Board of Patent Appeals and Interferences from the last decision of the Examiner.

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(I) REAL PARTY IN INTEREST

The real party in interest is Guardian Industries Corp., a corporation of the country of the United States. The co-assignee, C.R.V.C., having a place of business in Luxembourg, is a wholly owned subsidiary of Guardian Industries Corp.

(II) RELATED APPEALS AND INTERFERENCES

The Board's prior Decision on Appeal in connection with Appeal No. 2008-1077, decided on June 19, 2008, may affect or have a bearing on the Board's decision in this appeal.

The appellant, the undersigned, and the assignee are not aware of any other related appeals, interferences, or judicial proceedings (past or present), which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

(III) STATUS OF CLAIMS

Claims 1-2, 4-6, 8, and 11-14 are pending and have been rejected. Claims 3, 7, 9-10, and 15-34 previously were cancelled. No claims have been substantively allowed.

The rejections of claims 1-2, 4-6, 8, and 11-14 are being appealed.

(IV) STATUS OF AMENDMENTS

No amendments have been filed since the date of the Final Rejection.

(V) SUMMARY OF CLAIMED SUBJECT MATTER

This Section is for purposes of example only and is not limiting as to the scope of the claims that are pending.

Claim 1 relates to a heat treated coated article (e.g., Fig. 1; paragraphs 20-21) comprising a coating (e.g., 30 in Fig. 1; paragraph 21) supported by a glass substrate (e.g., 1 in Fig. 1; paragraph 21). The coating includes a first dielectric layer comprises zinc oxide from 40-150 Å thick (e.g., 3 and/or 7 in Fig. 1; paragraphs 21, 23, and 29). A first infrared (IR) reflecting layer comprising silver is located over at least the first dielectric layer comprising zinc oxide (e.g., 9 in Fig. 1; paragraphs 21 and 26). A second layer comprising zinc oxide is located over at least the first IR reflecting layer and the first dielectric layer (e.g., 17 in Fig. 1; paragraphs 21 and 29). A second IR reflecting layer comprising silver is located over and contacting the second layer comprising zinc oxide, with the second IR reflecting layer comprising silver having a thickness greater than the first IR reflecting layer comprising silver (e.g., 19 in Fig. 1; paragraphs 21 and 26). A layer consisting essentially of an oxide of NiCr is located over and contacting the second IR reflecting layer (e.g., 21 in Fig. 1; paragraphs 17-18, 21, and 27). A third layer comprising zinc oxide is located over and contacting the layer consisting essentially of the oxide of NiCr, the third layer comprising zinc oxide being 40-150 Å thick (e.g., 22 in Fig. 1, paragraphs 17-18, 21, and 29), with the third layer comprising zinc oxide being thicker than the second layer comprising zinc oxide, and with the layer consisting essentially of the oxide of NiCr being 20-45 Å thick (e.g., paragraph 34). Another

dielectric layer comprising tin oxide from 40-200 Å thick is located over at least the third layer comprising zinc oxide in the heat treated coated article (e.g., 23 in Fig. 1; paragraph 21). When measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance (R_s) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04 (e.g., paragraphs 17-19, 30, 35-38, and 44).

In addition to the features of claim 1, **claim 2** further specifies that at least one of the first and second layers comprising zinc oxide further comprising aluminum (e.g., paragraph 29).

In addition to the features of claim 1, **claim 4** further includes a layer which comprises silicon nitride (e.g., 3 in Fig. 1; paragraphs 21, 23-24, and 29) provided between the glass substrate (e.g., 1 in Fig. 1; paragraph 21) and the first dielectric layer comprising zinc oxide (e.g., 7 in Fig. 1; paragraphs 21, 23, and 29). .

In addition to the features of claim 4, **claim 8** further specifies that the dielectric layer comprising silicon nitride is Si-rich so as to be represented by Si_xN_y, where x/y is from 0.8 to 1.4 (e.g., 3 in Fig. 1; paragraphs 21, 23-24, and 29).

In addition to the features of claim 1, **claim 11** further specifies that when measured monolithically following heat treatment the coated article has a visible

transmission of at least 81% and a sheet resistance (R_s) of less than or equal to 2.1 ohms/square (e.g., paragraphs 17-19, 30, 35-38, and 44).

In addition to the features of claim 1, **claim 12** further specifies that the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 76% and a sheet resistance (R_s) of less than or equal to 3.0 ohms/square (e.g., paragraphs 17-19, 30, 35-38, and 44).

In addition to the features of claim 1, **claim 13** further specifies that the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 77% and a sheet resistance (R_s) of less than or equal to 2.5 ohms/square (e.g., paragraphs 17-19, 30, 35-38, and 44).

In addition to the features of claim 1, **claim 14** further specifies that the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 78% and a sheet resistance (R_s) of less than or equal to 2.5 ohms/square (e.g., paragraphs 17-19, 30, 35-38, and 44).

(VI) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First, whether claims 1, 4-6, and 11-14 are unpatentable over Glaser (U.S. Patent No. 5,837,361) in view of Depauw (U.S. Patent No. 5,153,054) in view of Hartig (U.S. Patent No. 5,557,462) under 35 U.S.C. § 103(a).

Second, whether claim 2 is unpatentable over Glaser, Depauw, and Hartig, in further view of either Anzaki (U.S. Patent No. 6,316,110) or Arbab (U.S. Patent No. 6,398,925) under 35 U.S.C. § 103(a).

Third, whether claim 8 is unpatentable over Glaser, Depauw, and Hartig, in further view of either Baldwin (U.S. Patent No. 6,472,636) or Sol (U.S. Patent No. 6,492,619) under 35 U.S.C. § 103(a).

(VII) ARGUMENT

The USPTO has the burden under 35 U.S.C. § 103 of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745, F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It can satisfy this burden only by showing that some objective teaching in the prior art, or that knowledge generally available to one of ordinary skill in the art, would have led that individual to combine the relevant teachings of the references to arrive at the claimed invention. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). The Federal Circuit has stated that "rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006); *see also* KSR v. Teleflex, 127 S. Ct. 1727, 1741 (2007) (quoting Federal Circuit statement with approval). Even assuming, *arguendo*, that a given combination of references is proper, the combination of references must in any event disclose the features of the claimed invention in order to render it obvious.

Furthermore, with respect to inherency rejections, the law is clear that for something to be "inherent" in a reference, it must "necessarily" be present. *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). The fact that a certain result or characteristic "may" occur or be present in the prior art is not sufficient to establish the inherence of that result of characteristic. *In re Rijckaert*, 9 F.3d 1531, 1534, 28 USPQ2d 1955, 1957 (Fed. Cir. 1993). The Board of Appeals has made clear that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact

and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." *Ex parte Levy*, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990).

A. Claims 1, 4-6, and 11-14 Are Not "Obvious" over Glaser, Depauw, and Hartig.

Claims 1, 4-6, and 11-14 stand rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Glaser (U.S. Patent No. 5,837,361) in view of Depauw (U.S. Patent No. 5,153,054) in view of Hartig (U.S. Patent No. 5,557,462). This three-way § 103 rejection is erroneous and should be reversed for at least the following reasons.

Claim 1 is directed to a heat treated coated article comprising a coating supported by a glass substrate, the coating comprising, *inter alia* "a second layer comprising zinc oxide located over at least the first IR reflecting layer and the first dielectric layer; a second IR reflecting layer comprising silver located over and contacting the second layer comprising zinc oxide, the second IR reflecting layer comprising silver having a thickness greater than the first IR reflecting layer comprising silver; a layer consisting essentially of an oxide of NiCr located over and contacting the second IR reflecting layer; a third layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr, the third layer comprising zinc oxide being 40-150 Å thick, *, the third layer comprising zinc oxide being thicker than the second layer comprising zinc oxide*, and *the layer consisting essentially of the oxide of NiCr being 20-45 Å thick*." The cited references do not disclose or suggest these features, alone or in

combination. Thus, the cited references, alone and in combination, do not render obvious claim 1.

Glaser does not teach or suggest heat treating. Depauw, which is introduced to make up for this fundamental deficiency of Glaser, discloses that the sacrificial metal oxide layer located between the IR reflecting layer and the layer comprising zinc oxide must be *thicker* if heat treatment is to be undertaken (col. 8, lines 23-28 of Depauw). In particular, Depauw states that the metal oxide layer ought to be 5-12 nm -- which is thicker than the range claimed in claim 1. Although Depauw does mention a broader overall thickness range of from 2-12 nm, it explains in no uncertain terms that *the low-end of this range is not appropriate for heat treated articles*. Thus, if one of ordinary skill in the art at the time of the invention were to have read the entirety of Depauw, it would have been recognized that the *upper-end* of the thickness range would have to be used for heat treated coated articles. Therefore, the claimed thickness of the layer consisting essentially of the oxide of NiCr, located above the IR reflecting layer comprising silver, would not be met by Glaser when modified by Depauw. In fact, Depauw's clear teaching regarding the need to *increase* the thickness of a layer when the article is to be heat treated *teaches away* from claim 1.

The totality of the prior art must be considered, and proceeding contrary to accepted wisdom in the art is evidence of non-obviousness. *In re Hedges*, 783 F.2d 1038, 228 USPQ 685 (Fed. Cir. 1986); MPEP 2145(X)(D)(3). In fact, this instant Appeal presents a set of facts directly analogous to the situation in *In re Hedges* (i.e., where Hedges' claimed process for sulfonating diphenyl sulfone at a temperature above 127

degrees C was contrary to accepted wisdom because the prior art as a whole suggested using lower temperatures for optimum results as evidenced by charring, decomposition, or reduced yields at higher temperatures). In this case, because Depauw discloses that if a layer stack comprising ZnO/Ag/metal layer/ZnO must have a thicker metal layer over the layer comprising silver if the coating undergoes heat treatment, this teaching must be considered when modifying Glaser's ZnO/Ag/NiCr layer stack. Thus, if that stack were modified based on the teaching of Depauw to include an additional layer comprising zinc oxide over the metal layer, *and* to be heat treated, then Glaser would also have to be modified to have a thicker metal layer above the layer comprising silver. If the coating of Glaser, including the NiCr layer (metal layer) disclosed by Glaser as above the IR reflecting layer, were modified based on Depauw, the NiCr layer (metal layer) would have to be between 5 and 12 nm thick (50 to 120 Å). In marked contrast, claim 1 requires that the layer consisting essentially of the oxide of NiCr be 20-45 Å thick. Accordingly, modified Glaser cannot meet the features of claim 1. As a result, one skilled in the art at the time of the invention would not have been led to the invention of claim 1 by the combination of Glaser and Depauw. Quite the contrary, one skilled in the art at the time of the invention would, if at all, have been led to a layer that is about 11-60% thicker than the highest range of the claimed layer consisting essentially of the oxide of NiCr. The alleged Glaser/Depauw/Hartig combination cannot be said to render obvious claim 1 under circumstances where, as here, the only relevant teaching would have led one skilled in the art to a thickness range far outside that which is claimed.

Moreover, claim 1 recites, *inter alia*, "a third layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr, the third layer comprising zinc oxide being 40-150 Å thick, *the third layer comprising zinc oxide being thicker than the second layer comprising zinc oxide*." This means that the third layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr is thicker than the second layer comprising zinc oxide, over which the second IR reflecting layer comprising silver is located and contacting. This language is supported by the example thicknesses in the instant specification. For example, in paragraphs [0034] and [0042], it can be seen that the third layer comprising zinc oxide (the one located over and contacting the layer consisting essentially of the oxide of NiCr) is *thicker* than the second layer comprising zinc oxide, over which the second IR reflecting layer comprising silver is located and contacting. The cited art does not teach or suggest this feature. In fact, the cited prior art teaches directly away from this structure.

Page 8 of Final Office Action provides a wholly unsupported, hindsight "rationale" for this specifically claimed thickness modification. There is nothing in the single sentence bridging cols. 5 and 6 of Depauw that even remotely relates to varying the relative thicknesses of multiple zinc oxide layers. At best, col. 6, lines 17-25 indicate that it is the presence (note: not the relative thicknesses) of the zinc oxide that helps in terms of preventing oxygen from reaching the underling layers. But even this statement does not correspond to a teaching or suggestion regarding the desirability of altering thicknesses -- much less to meet the relative thicknesses called for in claim 1. The Final

Office Action simply lacks the underlying facts needed to support the ultimate legal conclusion of obviousness.

Furthermore, although Depauw discloses layers comprising zinc oxide below and contacting an IR reflecting layer comprising silver, and above a metal layer that is over and contacting the IR reflecting layer comprising silver, Depauw cautions against the use of both layers of zinc oxide (col. 7, lines 21-50). Depauw is replete with warnings about using too much zinc oxide in a layer system, and states that its overall presence should be minimized. In fact, Depauw explicitly states that if zinc oxide is used below the IR reflecting layer *and* above the (sacrificial) metal layer, it is important that the layers' thicknesses are the same. These are further reasons why one skilled in the art at the time of the invention would not have modified Glaser based on Depauw's teachings to obtain above-specified relative thicknesses of claim 1.

Applicant simply is at a loss to understand how and why one skilled in the art would have arrived at the invention of claim 1 in the context of prior art that lacks any facts to support the allegedly "obvious" modification to Glaser, particularly when the references being relied on identify a thickness range outside the claimed value for heat treated embodiments and also expressly teach that there should be no differences in layer thicknesses.

Applicant also respectfully submits that the argument concerning the inherency of the specific emissivity, visible transmission, and sheet resistance characteristics called for in claim 1 is misplaced. For instance, the Final Office Action has not presented any scientific explanation or reasoning to account for the different values that actually are

specified in the cited art. In that regard, the very examples in Glaser and Depauw preclude a reliance on inherency because they establish that the claimed values need not necessarily result. The visible transmission in Glaser is below that which is called for, and some of the emissivity values are within the claimed range whereas others are outside of it. Although Depauw's examples have high visible transmission, the emissivity values in its examples are double that called for in the claims. Similar observations apply with respect to Hartig. There is no attempt to explain how or why these conflicting teachings are necessarily resolved in the alleged three-way combination such that the specifically claimed values must result. Mere possibilities -- and even probabilities -- are insufficient to support an inherency-based argument. The examples in the art being relied upon further demonstrate that the rejections are improper.

Similar arguments against the inherency-based argument apply with equal force to claims 11-14, which provide addition specific visible transmission and sheet resistance values. Contrary to the basic requirement summarized in the title of MPEP 2112(IV) -- i.e., that the Examiner must provide rationale or evidence tending to show inherency -- here, there has been no attempt to explain how or why these values would necessarily result from the three-way combination of Depauw, Glaser, and Hartig, much less how or why these values would necessarily result when the references teach conflicting values and values that lie outside of those that are specifically claimed. The rejections of claims 11-14 are flawed for these further reasons.

In sum, Applicant respectfully submits that (1) one skilled in the art at the time of the invention would have been led to a thickness range for the layer consisting essentially

of the oxide of NiC well outside that which is claimed by the alleged Depauw/Glaser/ Hartig combination, (2) one skilled in the art at the time of the invention would understand from Depauw that it is important to provide equal thicknesses for zinc oxide layers when they are used below the IR reflecting layer *and* above the (sacrificial) metal layer rather than the different relative thicknesses called for in claim 1, and (3) there simply is no explanation as to how or why the specifically claimed properties would result from the contradictory and inconsistent examples provided in the cited references. As such, Applicant respectfully requests that the rejection of claims 1, 4-6, and 11-14 be reversed.

B. Claim 2 Is Not "Obvious" over Glaser, Depauw, Hartig, and Anzaki or Arbab.

Claim 2 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Glaser, Depauw, and Hartig, in further view of either Anzaki (U.S. Patent No. 6,316,110) or Arbab (U.S. Patent No. 6,398,925). This rejection is erroneous and should be reversed for at least the following reasons.

Fundamental deficiencies with respect to the alleged combination of Glaser, Depauw, and Hartig have been shown in detail above. The further introduction of Anzaki or Arbab, even if appropriate (which Applicant does not concede), still would not make up for these deficiencies. Thus, Applicant respectfully requests that this rejection be reversed.

C. Claim 8 Is Not "Obvious" over Glaser, Depauw, Hartig, and Baldwin or Sol.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Glaser, Depauw, and Hartig, in further view of either Baldwin (U.S. Patent No. 6,472,636) or Sol (U.S. Patent No. 6,492,619). This rejection is erroneous and should be reversed for at least the following reasons.

Fundamental deficiencies with respect to the alleged combination of Glaser, Depauw, and Hartig have been shown in detail above. The further introduction of Baldwin or Sol, even if appropriate (which Applicant does not concede), still would not make up for these deficiencies. Thus, Applicant respectfully requests that this rejection be reversed.

CONCLUSION

In conclusion it is believed that the application is in clear condition for allowance; therefore, early reversal of the Final Rejection and passage of the subject application to issue are earnestly solicited.

Respectfully submitted,

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(VIII) CLAIMS APPENDIX

1. A heat treated coated article comprising a coating supported by a glass substrate, the coating comprising:

a first dielectric layer comprising zinc oxide from 40-150 Å thick;

a first infrared (IR) reflecting layer comprising silver located over at least the first dielectric layer comprising zinc oxide;

a second layer comprising zinc oxide located over at least the first IR reflecting layer and the first dielectric layer;

a second IR reflecting layer comprising silver located over and contacting the second layer comprising zinc oxide, the second IR reflecting layer comprising silver having a thickness greater than the first IR reflecting layer comprising silver;

a layer consisting essentially of an oxide of NiCr located over and contacting the second IR reflecting layer;

a third layer comprising zinc oxide located over and contacting the layer consisting essentially of the oxide of NiCr, the third layer comprising zinc oxide being 40-150 Å thick, the third layer comprising zinc oxide being thicker than the second layer comprising zinc oxide, and the layer consisting essentially of the oxide of NiCr being 20-45 Å thick;

another dielectric layer comprising tin oxide from 40-200 Å thick located over at least the third layer comprising zinc oxide in the heat treated coated article; and

when measured monolithically following heat treatment the coated article has a visible transmission of at least 80%, a sheet resistance (R_s) of less than or equal to 2.5 ohms/square, and a normal emissivity (E) of less than or equal to about 0.04.

2. The coated article of claim 1, wherein at least one of the first and second layers comprising zinc oxide further comprising aluminum.

4. The coated article of claim 1, further comprising a layer which comprises silicon nitride provided between the glass substrate and the first dielectric layer comprising zinc oxide.

5. The coated article of claim 1 further comprising another dielectric layer comprising silicon nitride located over and contacting the another layer comprising tin oxide.

6. The coated article of claim 1, further comprising a layer comprising tin oxide located between the first IR reflecting layer and the second layer comprising zinc oxide.

8. The coated article of claim 4, wherein the dielectric layer comprising silicon nitride is Si-rich so as to be represented by Si_xN_y, where x/y is from 0.8 to 1.4.

11. The coated article of claim 1, wherein when measured monolithically following heat treatment the coated article has a visible transmission of at least 81% and a sheet resistance (R_s) of less than or equal to 2.1 ohms/square.

12. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 76% and a sheet resistance (R_s) of less than or equal to 3.0 ohms/square.

13. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 77% and a sheet resistance (R_s) of less than or equal to 2.5 ohms/square.

14. The coated article of claim 1, wherein the coated article comprises a laminate including said substrate which supports the coating and is heat treated and that is laminated to another heat treated glass substrate, the laminate having a visible transmission of at least 78% and a sheet resistance (R_s) of less than or equal to 2.5 ohms/square.

(IX) EVIDENCE APPENDIX

None.

(X) RELATED PROCEEDINGS APPENDIX

Attached is a copy of the Board's prior Decision on Appeal in connection with Appeal No. 2008-1077, decided on June 19, 2008.